

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application.

COMPLETE LISTING OF THE CLAIMS:

Claims 1-20 : (Canceled)

Claim 21 : (Currently Amended) A method of automatic adjustment of devices having setting elements, comprising the steps of:

a) carrying out a first measurement of a characteristic curve to be controlled by the adjustment at predefined measurement points, at least one setting element assuming a first reference setting;

b) testing a termination condition, and terminating the method if the termination condition is satisfied; and

c) executing the following steps if the termination condition is not satisfied:

i) modifying the first reference setting of the at least one setting element, and measuring the characteristic curve again at predefined measurement points for a configuration of the at least one setting element,

ii) reproducing the first reference setting of the at least one setting element modified in step i),

iii) when there is more than one setting element, repeating the steps i) and ii) for each setting element,

- iv) calculating gradient functions of the characteristic curve,
- v) calculating new settings of the setting elements by minimizing an error function by using measured values obtained in steps a) and i) and the gradient functions calculated in step iv), and setting the setting elements to calculated values to adjust the devices, and
- vi) carrying out the method again, beginning with step a) with the new settings calculated in step v) serving as a new reference setting.

Claim 22 : (Previously Presented) The method according to claim 21, in that the first reference setting of the at least one setting element is assumed to be in a middle of a setting range of the at least one setting element, or is predefined by means of values from experience, or is determined by a preliminary adjustment method.

Claim 23 : (Previously Presented) The method according to claim 21, in that after each measurement of the characteristic curve, a test of the termination condition is carried out, and the method is terminated if the termination condition is satisfied.

Claim 24 : (Previously Presented) The method according to claim 21, in that the test of the termination condition comprises an automatic comparison between the measured values of the characteristic curve and predefinable desired values or desired ranges.

Claim 25 : (Previously Presented) The method according to claim 21, in that the measurement of the characteristic curve is carried out as a scalar or vectorial measurement.

Claim 26 : (Previously Presented) The method according to claim 21, in that, in order to minimize the error function in step v), a gradient method and/or a random method is used.

Claim 27 : (Previously Presented) The method according to claim 21, in that the minimization of the error function in step v) is terminated if, at one of the measurement points, a difference between a last determined theoretical value of the characteristic curve and the measured value of the characteristic curve assumes or exceeds a first predefinable magnitude ($\Delta S_{11\max}$) for a corresponding setting of the at least one setting element, or if, at one of the measurement points, a difference between a last determined theoretical setting and the corresponding setting of the at least one setting element assumes or exceeds a second predefinable magnitude ($\Delta E_{E\max}$), or if, in a set of predefinable measurement points, the last determined theoretical values of the characteristic curve have reached a predefinable desired value or desired range, or if, in a set of predefinable measurement points, the difference between theoretical values, determined in successive steps of the minimization method, of the predefinable measurement points assumes or falls below a third predefinable magnitude.

Claim 28 : (Previously Presented) The method according to claim 27, in that the predefinable magnitudes and/or the predefinable measurement points for each device to be adjusted are determined individually by means of test measurements.

Claim 29 : (Previously Presented) The method according to claim 28, in that the theoretical values of the characteristic curve are determined by calculating a linear approximation function of the characteristic curve.

Claim 30 : (Previously Presented) The method according to claim 29, in that the gradient function of a characteristic curve (f) is determined in accordance with the following rules:

$$\begin{aligned}
 f_{\text{Gradient}}(a, i) &= df(a, i) / dEE(i) \\
 &= (f(a, i, 1) - f(a, i, 0)) / (EE(i, 1) - EE(i, 0)), \\
 \text{where: } i &= \text{number of the setting element,} \\
 a &= \text{parameter,} \\
 EE &= \text{setting element,} \\
 EE(i, 0) &= \text{position of the setting element No. } i \\
 &\quad \text{before the modification of the} \\
 &\quad \text{reference setting,} \\
 EE(i, 1) &= \text{position of the setting element No. } i \\
 &\quad \text{after the modification of the reference} \\
 &\quad \text{setting,} \\
 f(a, i, 0) &= f \text{ before the modification of the} \\
 &\quad \text{reference setting of the setting element} \\
 &\quad \text{No. } i, \text{ and} \\
 f(a, i, 1) &= f \text{ after the modification of the} \\
 &\quad \text{reference setting of the setting element} \\
 &\quad \text{No. } i.
 \end{aligned}$$

Claim 31 : (Previously Presented) The method according to claim 21, in that for a characteristic curve which, in addition to the setting of the setting elements, depends

on further variable parameters, for each configuration of the setting elements, a measurement of the characteristic curve for a plurality of measurement points is carried out, each parameter assuming a plurality of different values.

Claim 32 : (Previously Presented) The method according to claim 31, in that a number of the measurement points corresponds to a number of the setting elements.

Claim 33 : (Previously Presented) The method according to claim 21, in that the device to be adjusted by means of adjustment is designed as a microwave filter.

Claim 34 : (Previously Presented) The method according to claim 33, in that for each configuration of the adjusting elements of the microwave filter, a measurement of the characteristic curve is carried out for a plurality of measurement points, and in that a frequency parameter assumes a plurality of different values.

Claim 35 : (Previously Presented) The method according to claim 34, in that the measurement points are distributed uniformly only over a forward pass range of the microwave filter.

Claim 36 : (Previously Presented) The method according to claim 35, in that the characteristic curve to be controlled describes a reflection factor (S_{11}) and/or an S_{12} parameter and/or an S_{21} parameter and/or an S_{22} parameter of the microwave filter.

Claim 37 : (Previously Presented) The method according to claim 21, in that the calculation of new settings of the setting elements in step v) is carried out by a theoretical behavior of each individual measurement point in the event of a simultaneous change in all the setting elements being simulated by means of linear superposition.

Claim 38 : (Previously Presented) An arrangement having a processor set up for automatic adjustment of devices having setting elements, comprising:

a) means for carrying out a first measurement of a characteristic curve to be controlled by the adjustment at predefined measurement points, the setting elements assuming a first reference setting;

b) means for testing a termination condition, and for terminating adjustment if the termination condition is satisfied, and for executing the adjustment if the termination condition is not satisfied;

c) means for modifying the first reference setting of the setting elements, and for measuring the characteristic curve again at predefined measurement points for a configuration of the setting elements;

d) means for reproducing the first reference setting of the setting elements modified by the modifying means;

e) in the presence of a plurality of the setting elements, means for repeating operation of the modifying means and the reproducing means for each setting element;

f) means for calculating gradient functions of the characteristic curve;

g) means for calculating new settings of the setting elements by minimizing an error function by using measured values obtained by the carrying means and the modifying means and the gradient functions calculated by the calculating means, and means for setting the setting elements to the calculated values; and

h) means for carrying out the adjustment again, with the new settings calculated by the calculating means.

Claim 39 : (Previously Presented) A computer program product comprising a computer-readable storage medium on which a program is stored which, after the program has been loaded into a memory of a computer, makes it possible for the computer to carry out a method for automatic adjustment of devices having setting elements, the adjustment comprising the steps of:

a) carrying out a first measurement of a characteristic curve to be controlled by the adjustment at predefined measurement points, the setting elements assuming a first reference setting;

b) testing a termination condition, and terminating the adjustment if the termination condition is satisfied; and

c) executing the following steps if the termination condition is not satisfied:

i) modifying the first reference setting of the setting elements, and measuring the characteristic curve again at predefined measurement points for a configuration of the setting elements,

ii) reproducing the first reference setting of the setting elements modified in step i),

iii) in the presence of a plurality of the setting elements, repeating the steps i) and ii) for each setting element,

iv) calculating gradient functions of the characteristic curve,

- v) calculating new settings of the setting elements by minimizing an error function by using measured values obtained in steps a) and i) and the gradient functions calculated in step iv), and setting the setting elements to the calculated values, and
- vi) carrying out the adjustment again, beginning with step a) with the new settings calculated in step v) serving as a new reference setting.

Claim 40 : (Previously Presented) A computer-readable storage medium, on which a program is stored which, after the program has been loaded into a memory of a computer, makes it possible for the computer to carry out a method for automatic adjustment of devices having setting elements, the adjustment comprising the following steps:

a) carrying out a first measurement of a characteristic curve to be controlled by the adjustment at predefined measurement points, the setting elements assuming a first reference setting;

b) testing a termination condition, and terminating the adjustment if this condition is satisfied; and

c) executing the following steps if the termination condition is not satisfied:

- i) modifying the first reference setting of the setting elements, and measuring the characteristic curve again at predefined measurement points for a configuration of the setting elements,

- ii) reproducing the first reference setting of the setting elements modified in step i),
- iii) in the presence of a plurality of the setting elements, repeating the steps i) and ii) for each setting element,
- iv) calculating gradient functions of the characteristic curve,
- v) calculating new settings of the setting elements by minimizing an error function by using the measured values obtained in steps a) and i) and the gradient functions calculated in step iv), and setting the setting elements to the calculated values, and
- vi) carrying out the adjustment again, beginning with step a) with the new settings calculated in step v) serving as a new reference setting.

ABSTRACT AMENDMENTS

Please amend the Abstract as follows:

ABSTRACT OF THE DISCLOSURE

~~In a method and an arrangement for automatic adjustment of devices~~ Devices having setting elements, ~~and a corresponding computer program product and computer-readable storage medium, the adjustment includes~~ are adjusted by carrying out a first measurement of a characteristic curve to be controlled ~~by the adjustment~~ at predefined measurement points, each setting element assuming a reference setting; testing a termination condition and terminating the method if this condition is satisfied; and, if the termination condition is not satisfied, modifying the reference setting of each setting element and measuring the characteristic curve again at predefined measurement points for this configuration ~~of the setting elements~~; reproducing the initial reference setting of the modified setting element; when there is more than one setting element, calculating the gradient functions of the characteristic curve; calculating new settings ~~of the setting elements~~ by minimizing an error function by using the obtained measured values and the calculated gradient functions; and carrying out the method again, beginning with the new calculated settings serving as the new reference setting.